

USSR/Physics - Spectroscopy, Crystals May 52

"Some Laws Governing the Spectra of Low-Frequency Combination Scattering [Raman] of Isomorphous Crystals of Dihalogen-Substituted Derivatives of Benzene," Ye. F. Gross, A. V. Korshunov, V. A. Selkin, Leningrad State U

"Zhur Eksp'er i Teoret Fiz" Vol 22, No 5, pp 579-589

Outlines exptl research on subject spectra which allows one to attribute some spectral frequencies of scattering to orientational mol oscillation in the cryst lattice. Proposes the assumption that the revealed low-frequency lines of small intensity

215191

are excited by translational mol oscillations, due to imperfections of the cryst lattice. Indebted to N. N. Porfir'yeva. Received 7 Sep 51.

KORSHUNOV, A.V.

215191

KORSHUNOV, A. V.

PA 236T84

USSR/Physics - Spectra of Crystals

Nov 52

"Spectra of Combined Scattering of Mixed Crystals of Organic Substances," A. V. Korshunov and V. A. Sel'kin, Leningrad State Univ

"Zhur Eksper i Teoret Fiz" Vol 23, No 5, pp 576-583

Subject spectra of paradichlorobenzene, paradibromobenzene, parachlorophenol, and parabromophenol were investigated. Authors attempt to find in some cases correlation between lattice structure of various crystals and their spectra of combined scattering at low frequencies. Indebted to Ye. F. Gross. Received 23 Aug 52.

236T84

KORSHUNOV, A. V.

235T101

USSR/Physics - Raman Spectra

11 Sep 52

"Raman Spectra of Small Frequencies of Certain Organic Crystals," A. V. Korshunov, Phys Inst, Leningrad State U imeni Zhdanov

"Dok Ak Nauk SSSR" Vol 86, No 2, pp 271, 272

Gives certain results of exptl investigations on subject spectra of bromoform, acenaphthene, trichlorobenzol, orthochloronitrobenzol, parabromotoluol, and xlenol. Acknowledges the assistance of B. A. Sel'kin. Submitted by Acad A. A. Lebedev 16 Jul 52.

235T101

KORSHUNOV, A.V.

Low frequency spectra of combination scattering of the crystals of para-chlorophenol, parabromophenol and of their mixed crystals. Dokl. Akad. Nauk SSSR 86, No.4, 695-6 '52. (MLRA 5:11)
(PA 56 no.668:5408 '53)

Tabulates results of investigated spectra which show similar mol structure of parachlorophenol and para bromophenol and their ability to form mixed crystals. However, these crystals showed no similarity of Raman spectra at low frequencies; therefore, isomorphism of these crystals should not be found. Presented by Acad A. A. Lebedev 16 Jul 52,q

252T95

KORSHUNOV, A.V., assistant; SEL'KIN, V.A., laborant.

Raman spectra of mixed paradichlorobenzene and paradibromobenzene
crystals. Nauch. biul. Len.un. no.31:19-22 '53. (MLRA 10:3)

1. Fizicheskiy institut.
(Benzene crystals--Spectra)

KORSHUNOV, A.V.; SARAPKIN, P.S.

Changes in the width of lines in the Raman spectra of bromoform and chloroform during the transition from the solid to the liquid state. Trudy Sib.tekh.inst. no.24:13-17 '59. (MIRA 14:3)
(Raman effect) (Bromoform--Spectra) (Chloroform--Spectra)

S/058/62/000/002/004/053
A058/A101

AUTHORS: Korshunov, A. V., Sarapkin, P. S.

TITLE: Raman spectra of anomalously miscible organic crystals

PERIODICAL: Referativnyy zhurnal, Fizika, no. 2, 1962, 35, abstract 2V266
("Tr. Sibirsk. tekhnol. in-ta", 1959, v. 24, 18-23)

TEXT: For the purpose of studying regularities in the vibrations of crystal lattices, the Raman spectra of the following mixed naphthalene (I) and diphenyl (II) crystals were investigated in the low-frequency range (40 - 120 cm⁻¹): 90% (I) + 10% (II), 80% (I) + 20% (II), 20% (I) + 80% (II) and 10% (I) + 90% (II). The crystal growing was effected from melts by the method of the drawn out-capillary tube. It took several months to grow the single crystals. The spectra of 90% (I) and 80% (I) mixed crystals resemble the spectrum of pure (I), from which they differ by a somewhat lower value of frequencies. An analogous effect takes place in the spectra of 90% (II) and 80% (II) as compared with the spectrum of (II), but in this case line frequencies are increased. It is assumed that the investigated mixed crystals have a lattice that is quasi-structural with the lattice of the fundamental component. V. Pivovarov
[Abstracter's note: Complete translation]

Card 1/1

KORSHUNOV, A.V.; VOLKOV, V.Ye.

Spectroscopic determination of the isomorphic nature of certain
organic crystals. Trudy Sib.tekh.inst. no.24:24-29 '59.
(MIRA 14:3)

(Organic compounds--Spectra)

KORSHUNOV, A.V., KOLOVSKIY, A.A.

Low-frequency Raman spectra of crystals of certain alums. Izv.Sib.
otd.AN SSSR no.1:98-102 '60. (MIRA 13:7)

1. Institut fiziki Sibirskogo otdeleniya AN SSSR.
(Raman spectra) (Alums--Spectra)

54180

27741
S/058/61/000/007/020/086
A001/A101

AUTHORS: Korshunov, A.V., Kolovskiy, A.A.

TITLE: Raman spectra of solid solutions of some crystal heptahydrates

PERIODICAL: Referativnyy zhurnal. Fizika, no. 7, 1961, 136, abstract 7V272
("Dokl. Mezhvuz. nauchn. konferentsii po spektroskopii i spektr.
analizu". Tomsk, Tomskiy un-t, 1960, 102 - 103)

TEXT: Raman spectra of crystal heptahydrates of the salts $MgSO_4$, $FeSO_4$, $ZnSO_4$ and their solid solutions were investigated for determining the vibrational frequency of intermolecular hydrogen bonds. It has been established that lines 217 and 250 cm^{-1} correspond to vibrational transitions of purely hydrogen bonds. A definite correlation is observed between displacement of the OH-band disturbed by the hydrogen bond and displacement of hydrogen bond lines in the range of low frequencies.

[Abstracter's note: Complete translation]

Card 1/1

S/058/62/000/006/035/136
A061/A10.

AUTHORS: Korshunov, A. V., Volkov, V. Ye.

TITLE: On some rules governing the spectra of symmetrical trihalide-substituted benzene crystals

PERIODICAL: Referativnyy zhurnal, Fizika, no. 6, 1962, 36, abstract 6V246
(In collection: "Nekotoryye vopr. emission. i molekulyarn. spektroskopii". Krasnoyarsk, 1960, 168 - 172)

TEXT: Low-frequency Raman spectra of 1,3,5-trichlorobenzene (I) and 1,3,5-tribromobenzene (II) single crystals were examined in nonpolarized light for two orientations of the single crystals. The following lines (cm^{-1}) were observed in spectrum (I): 21.4; 33.4; 46.4, and 57. In (II): 21.4; 28.9; 36.5, and 43.9. The line intensities were found to depend on the single crystal orientation. The spectrum was interpreted in terms of rotational molecular oscillations in the crystal lattice. The conclusion is corroborated by indirect data on the correlation between melting temperature, the coefficient of compact packing, and the mean value of the quasielastic constant for rotational oscillations.
[Abstracter's note: Complete translation] V. Pivovarov

Card 1/1

S/058/62/000/006/034/136
A061/A101

AUTHORS: Korshunov, A. V., Kolovskiy, A. A.

TITLE: On the spectra of Raman effect of light in some types of alum

PERIODICAL: Referativnyy zhurnal, Fizika, no. 6, 1962, 35, abstract 6V238
(In collection: "Nekotoryye vopr. emission. i molekulyarn. spektroskopii". Krasnoyarsk, 1960, 180 - 183)

TEXT: The hydrogen bond was studied on Raman spectra in the low-frequency range of isomorphous alum types $KAl(SO_4)_2 \cdot 12H_2O$, $NH_4Al(SO_4)_2 \cdot 12H_2O$, and their mixed crystals. Nine lines: 37, 47, 80, 116, 153, 192, 232, 272, and 332 cm^{-1} were observed in the low-frequency range. These lines can be divided into two groups: one comprising the first six lines of about equal intensity, hypothetically referred to intermolecular ion vibrations, and the other composed of the last three lines with intensities decreasing in succession, which belong to hydrogen bond vibrations. The energy of hydrogen bond dissociation was calculated and found to be equal to 4.2 kcal/mole. ✓

V. Pivovarov

[Abstractor's note: Complete translation]

Page 1/1

KORSHUNOV, A.V.

First Siberian Conference on Spectroscopy. Opt.i spektr. 12
no.5:665-666 My '62. (MIRA 15:5)
(Siberia--Spectroscopy--Congresses)

KORSHUNOV, A.V.

110

PHASE I BOOK EXPLOITATION

SOV/6181

Ural'skoye soveshchaniye po spektroskopii. 3d, Sverdlovsk, 1960.
Materialy (Materials of the Third Ural Conference on Spectros-
copy) Sverdlovsk, Metallurgizdat, 1962. 197 p. Errata slip
inserted. 3000 copies printed.

Sponsoring Agencies: Institut fiziki metallov Akademii nauk SSSR.
Komissiya po spektroskopii; and Ural'skiy dom tekhniki VSNTSO.

Eds. (Title page): G. P. Skornyakov, A. B. Shayevich, and S. G.
Bogomolov; Ed.: Gennadiy Pavlovich Skornyakov; Ed. of Publish-
ing House: M. L. Kryzhova; Tech. Ed.: N. T. Mal'kova.

PURPOSE: The book, a collection of articles, is intended for staff
members of spectral analysis laboratories in industry and scien-
tific research organizations, as well as for students of related
disciplines and for technologists utilizing analytical results.

Card 1/15

Materials of the Third Ural Conference (Cont.)

110
SOV/6181

COVERAGE: The collection presents theoretical and practical problems of the application of atomic and molecular spectral analysis in controlling the chemical composition of various materials in ferrous and nonferrous metallurgy, geology, chemical industry, and medicine. The authors express their thanks to G. V. Chentsova for help in preparing the materials for the press. References follow the individual articles.

TABLE OF CONTENTS:

Foreword

3

PART I

Sherstkov, Yu. A., and L. F. Maksimovskiy. Investigation of the dependence of the total intensity of spectral lines on the concentration of elements in an arc-discharge plasma

4

Card 2/15

Materials of the Third Ural Conference (Cont.)

SOV/6181

PART II

- Vasilevskiy, K. P., and B. S. Neporent. Absorption of infrared radiation by water vapor in mixtures with foreign gases 145
- Kislovskiy, L. D. New method of absorption analysis based on reflection 151
- Bogomolov, S. G., A. P. Kolesov, M. P. Grebenshchikova, and E. I. Gorbunova. Utilization of ultraviolet spectroscopy in analysis of by-product coke xylene 157
- Korshunov, A. V., and A. A. Kolovskiy. Spectra of low-frequency Raman light scattering by some heptahydrate crystals 164

Card 12/15

L 17794-63

ENP(j)/EPF(c)/SWI(m)/BDS Pc-4/Pr-4 RM/WW

ACCESSION NR: AP3005838

S/0051/63/015/002/0182/0185

AUTHOR: Korshunov, A. V.; Bondarev, A. F.

63

TITLE: On line widths of low-frequency Raman light scattering in crystals of some paradisubstituted halogen derivatives of benzene

SOURCE: Optika i spektroskopiya, v. 15, no. 2, 1963, 182-185

TOPIC TAGS: Raman scattering, Raman scattering line width, low frequency Raman line width, organic crystal Raman scattering, parachloro-bromobenzene, parachloro-iodobenzene, rotation spectrum, molecular rotation spectrum

ABSTRACT: Photographic methods have been used to measure the line widths of the low-frequency (93 cm^{-1}) Raman scattering spectra of p-chlorobromobenzene and p-chloriodobenzene crystals at room temperature. Results were compared to those obtained from other paradisubstituted halogen derivatives of benzene, and previous results concerning the molecular structure of these substances were confirmed by analysis of line widths in the low-frequency spectra

Card 1/2

L 17794-63

ACCESSION NR: AP3005838

of the crystals. The role of some possible line-broadening mechanisms such as rotational oscillations of molecules and chaotic reorientation of lattice molecules around their axes of symmetry is considered. It is shown that rotational braking barriers can be determined using data on the widths of lines of rotational lattice oscillations. It is assumed that thermal fluctuations of oscillation frequencies play a considerable role in broadening lines due to the rotational oscillations of molecules in organic crystals. Orig. art. has: 2 tables, 1 figure, and 5 formulas.

ASSOCIATION: none

SUBMITTED: 05Nov62

DATE ACQ: 06Sep63

ENCL: 00

SUB CODE: PH, CH

NO REF SOV: 004

OTHER: 001

Card 2/2

L 16714-65 EWT(m)/EPF(c)/EWP(j) Pg-4/Pr-4 ESD(t)/ESD(c)/ESD(gs)/SSD/AFWL/
 ASD(a)-5/AFMD(t)/AFETR/RAEM(a) RM S/0058/64/000/010/D025/D025
 ACCESSION NR: AR5000775

SOURCE: Ref. zh. Fizika, Abs. 10D192

AUTHORS: Korshunov, A. V.; Solov'yev, L. S.; Shufledovich, V. I.; Nekoshnova, N. S.

TITLE: Infrared absorption spectra of certain substances with hydrogen bonds in different aggregate states

CITED SOURCE: Tr. Sibirsk. tekhnol. in-ta, sb. 36, 1963, 10-17

TOPIC TAGS: Ir absorption spectrum, hydrogen bond, band spectrum, polarization

TRANSLATION: Infrared absorption spectra of phenol, resorcin, guaiacol, and a
 1-naphthol in different aggregate states and at a temperature of liquid nitrogen are obtained.
 The polarization of the bands of the substances in the solid state was also investigated.
 It is found that in the liquid and particularly in the crystalline state the investigated substances have a few additional bands which are less intense than the fundamental bands

Card 1/2

L 16715-65

ACCESSION NR: AR5000773

was found to be 5.65×10^3 neutrons/mole-roentgen.

SUB CODE: NP

ENCL: 00

Card 2/2

ACCESSION NR: AR4040824

S/0058/64/000/005/D029/D029

SOURCE: Ref. zh. Fizika, Abs. 5D220

AUTHOR: Korshunov, A. V.; Kolovskiy, A. A.; Sarapkin, P. S.

TITLE: Spectra of combinational light scattering of certain crystalline heptahydrates and their mixed crystals

CITED SOURCE: Tr. Sibirsk. tekhnol. in-ta, sb. 36, 1963, 18-25

TOPIC TAGS: single crystal, mixed crystal, heptahydrate, light scattering, spectrum investigation

TRANSLATION: There are investigated the spectra of single crystals of $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$, $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$, $\text{ZnSO}_4 \cdot 6\text{H}_2\text{O}$ and $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ and mixed heptahydrate crystals of sulfates of Mg and Zn, Mg and Fe. There is conducted an interpretation of frequencies. The assumption is expressed that a change of lattice frequencies during transition from one substance to the other, and the constancy of frequencies

Card 1/2

L 2182-66 EWT(m)/EPF(c)/EWP(j) RM

ACCESSION NR: AR5014389

UR/0058/65/000/004/D026/D026

SOURCE: Ref. zh. Fizika, Abs. 4D195

AUTHOR: Korobkov, V. S.; Ivanov, E. I.; Korshunov, A. V.

TITLE: Infrared absorption spectra of ethers

CITED SOURCE: Sb. Spektroskopii. M., Nauka, 1964, 122-123

TOPIC TAGS: diethyl ether, vibration spectrum, ir spectrum

TRANSLATION: Oscillation frequencies in the main bands of the infrared spectra of certain ethers in the $1600-660\text{ cm}^{-1}$ range are presented. In the spectra of diethyl, ethylbenzol and dibenzol ethers the C-O valence bond oscillations are located in the $1060-1150\text{ cm}^{-1}$ range, and in the spectra of anizole, phenetole and guyaquile the C-O bonds are located in the $1230-1270\text{ cm}^{-1}$ region. The C-O valence bond oscillations of the ethers are insensitive to molecular interactions.

SUB CODE: OC, OP

ENCL: 00

Card 1/1

L 64701-65 EWT(1)/EWT(m)/EFF(c)/EWP(j)/T IJP(c) GG/RM

ACCESSION NR: AR5012269

UR/0058/65/000/003/D044/D044

SOURCE: Ref. zh. Fizika, Abs. 3D335

AUTHOR: ^{44,55} Bondarev, A. F.; ^{44,55} Korshunov, A. V.

TITLE: Determining the braked molecular rotational barriers in certain organic crystals from the Raman spectra of low frequency light

^{21,44,55} CITED SOURCE: Tr. Komis. po spektroskopii. AN SSSR, vyp. 1, 1964

^{44,55} TOPIC TAGS: single crystal, nuclear potential barrier, organic crystal, benzene, naphthalene, Raman spectrum

TRANSLATION: The fluctuation mechanism of line broadening is used as a basis for developing a simple method to determine the potential barriers for rotational vibrations of molecules in organic crystals. It is necessary for this purpose to know the frequencies and widths of the lines which pertain to the corresponding oscillations at a given temperature. The method is verified on single crystals of benzene, some of its substituted compounds, naphthalene, etc. There is good agreement with the data of other methods where a comparison can be made.

SUB CODE: SS, NP

ENCL: 00

Card 1/1

KORSHAK, A.I.; KORDAKH, A.F.

Line width and interpretation of frequencies of low-frequency
scattering spectra. Vest. LGU 19 no.16:22-25 1961.
(MIRA 17:11)

L 1300-66 EWT(m)/EPF(c)/ENP(j)/T RJM

ACCESSION NR: AR5014391

UR/0058/65/000/004/D028/D028

SOURCE: Ref. zh. Fizika, Abs. 4D209

AUTHOR: Shufledovich, V. I.; Solov'yev, L. S.; Kuz'mina, Z. M.; Nekoshnova, N. S.; Sarapkin, P. S.; Korshunov, A. V.; Finkel'shteyn, A. F.

TITLE: Some spectral characteristics of the side chains in furane compounds

CITED SOURCE: Sb. Spektroskopiya. M., Nauka, 1964, 118-120

TOPIC TAGS: spectrographic analysis, Raman spectrum, IR spectrum, furane resin, aldehyde, conjugate bond system, alkyl radical

TRANSLATION: The authors studied the effect of the furane ring on the position of the stretching vibration bands of CH_3 , C=O and C=C groups in the Raman and IR spectra of 6 furane derivatives. The frequencies of the fundamental bands in the spectra of these compounds are given in the $4050\text{--}216\text{ cm}^{-1}$ range. The position of symmetric and skew-symmetric stretching vibration bands in CH_3 groups in the spectra of furfurylidene acetone, sylvan and 1-(α -furyl)-butanone-3 is practically the same as the ordinary position of the bands for this group. The position of stretching

Card 1/2

L 1300-66

ACCESSION NR: AR5014391

vibration bands for C=O ($1680-1695\text{ cm}^{-1}$ in the spectra of the two latter compounds) indicates that conjugation of this bond with the furane ring results in the same effects as conjugation with one double bond. Yu. Kissin.

SUB CODE: OC, OP

EXCL: DO

mlr
Card 2/2

L 42871-66 EWT(1)/EWT(m)/EWP(1)/T 1 JP(1) 000/012/D033/D033
ACC NKT AR6017234 SOURCE CODE: UR/0058/65/000/012/D033/D033

AUTHOR: Korshunov, A. V.; Solov' yev, L. S.

ORG: none

TITLE: Infrared absorption spectra of paradihalogen-substituted benzene in various states of aggregation

SOURCE: Ref. zh. Fizika, Abs. 12D270

REF SOURCE: Tr. Komis. po spektroskopii. AN SSSR, t. 3. vyp. 1, 1964, 588-594

TOPIC TAGS: IR spectrum, absorption spectrum, benzene, liquid nitrogen, single crystal growth, halogen

ABSTRACT: The infrared absorption spectra have been obtained for paradihalogen-substituted benzene in various states of aggregation and at the temperature of liquid nitrogen. The method of growing fine single crystals has been worked out. Polariza-

Card 1/2

Card 014

L 02233-67 EWT(1)/EWT(m)/T/EWP(t)/ETI IJP(c) JD
ACC NR: AR6013668 SOURCE CODE: UR/0058/65/000/010/E055/E055

AUTHOR: Podgayetskaya, R. I.; Kolovskiy, A. A.; Korshunov, A. V.

TITLE: Investigation of lattice vibrations of single crystals with different ions by the Raman scattering method

SOURCE: Ref. zh. Fizika, Abs. 10E436

REF. SOURCE: Tr. Komis. po spektroskopii. AN SSSR. t. 3, vyp. 1, 1964, 582-587

TOPIC TAGS: Raman spectroscopy, crystal lattice vibration, sulfate, selenium compound

ABSTRACT: The authors obtain the low-frequency spectra of Raman lines of sulfate and selenate crystal-hydrates with different cations. They consider the connection between these spectra and the vibrations of crystalline octahedral groups consisting of metallic cations surrounded by water molecules. The lattice vibrations are interpreted by comparison of the low-frequency spectra of the sulfate and selenate crystal-hydrates. [Translation of abstract].

SUB CODE: 20

Card 1/1

L 04235-67 EWT(m)/T/EWP(t)/ETI IJP(c) JD
ACC NR: AR6031886 SOURCE CODE: UR/0058/66/000/006/D054/D054
"APPROVED FOR RELEASE: 06/14/2000" CIA-RDP86-00513R000824930012-2

AUTHOR: Podgayetskaya, R. I.; Kolovskiy, A. A.; Korshunov, A. V.

TITLE: Width of 1-f lines of barium nitrate single-crystals

SOURCE: Ref. zh. Fizika, Abs. 6D441

REF SOURCE: Sb. Optich. issled. molekulyarn. dvizheniya i mezhmolekulyarn. vzaimodeystv. v zhidkostyakh i rastvorakh. Tashkent, Nauka, 1965, 65-69

TOPIC TAGS: 1f line, barium nitrate, Raman spectrum, potential barrier, anion oscillation

ABSTRACT: Raman spectra of a $\text{Ba}(\text{NO}_3)_2$ are investigated in 1-f region. The spectrum consists of 6 lines. Three of the more intense lines of 80, 126, and 142 cm^{-1} , are 3--6 cm^{-1} in width. Computational values of the potential barriers for various anion oscillations in relation to various axes are given. [Translation of abstract]

SUB CODE: 07/

Card 1/1

KORSHUNOV, A.Ye.

Effect of the content of volatile matter in gunpowder on its combustion
velocity. Trudy KKHTI no.11:139-143 '47. (MIRA 12:11)
(Gunpowder)

Korshunov, B. G.

Chlorination of niobium pentoxide and zirconium di-
oxide. I. S. Morozov and B. G. Korshunov (N. S. Kurnak-
ov Inst. Gen. Inorg. Chem., Moscow). Khim. Rezhikh
Elementov, Akad. Nauk S.S.S.R., Inst. Obshchei i Neorg.
Khim. 1955, No. 2, 102-14. For $2\text{Nb}_2\text{O}_5 + 6\text{Cl}_2 = 4\text{NbO}$
 $\text{Cl}_2 + 3\text{O}_2$ the equil. const. K at 800° is 2.5×10^{-17} , at 900°
 6.37×10^{-18} , at 1000° 7.14×10^{-18} , at 1100° 1.54×10^{-18} ;
 ΔF at 800° is 81400 cal., at 900° 70210, at 1000° 70280, at
 1100° 61640. For $\text{ZrO}_2 + 2\text{Cl}_2 = \text{ZrCl}_4 + \text{O}_2$ K at
 1000° is 2.41×10^{-18} , at 1100° 7.7×10^{-19} , at 1100° 2.03
 $\times 10^{-18}$; ΔF at 1000° is 32720 cal., at 1100° 32120, and
 at 1200° 31560 cal. G. M. Kosolapoff

KORSHUNOV, B. B.

Determination of cesium as cesium blamuth iodide.
V. B. Plyushchev and B. B. Korshunov (M. V. Lomonosov Inst. Fine Chem. Technol., Moscow, U.S.S.R. 10, 107-11 (1955) 10, 110-23; J. Anal. Chem. U.S.S.R. 10, 107-11 (1955) (Engl. translation).—The outlined method is a modification of the Tananayev method (C.A. 26, 4271, 5274). The improvement consists in eliminating H₂O in the detn. of Cs or by using the min. vol. of H₂O where unavoidable. The reagent is prepd. by mixing dry Bi₂O₃ 5 and KI 17 g., adding to it 50 ml. of glacial AcOH, and heating the whole to a boil while stirring. The CsCl-contg. soln. is evapd. to dryness, dissolved in a min. vol. of glacial AcOH, and the reagent added. K, Li, Rb, Mg, and Be chlorides dissolve in AcOH. NH₄, Na, Ca, and Al chlorides do not dissolve in AcOH and the dry residue should be dissolved in 1 but not more than 3 ml. of H₂O before adding the reagent. Sulfate and carbonate solns. are analyzed similarly. The above-mentioned elements do not interfere but the ratio of Cs:Rb should not exceed 1:3. By this method 99.7% of Cs present is pptd. The same procedure is applicable to the detn. of Cs in pollucite. Pollucite was decompd. in HCl. M. Hosh

12/11/55
①

Korshunov, B. G.

Thermal and tensiometric study of the system NbCl_5 - ZrCl_4 - NaCl . I. S. Morozov and B. G. Korshunov (M. V. Lomonosov Inst. Fine Chem. Technol., Moscow). Zhur. Neorg. Khim. 1, No. 1, 145-57 (1960).—The concn-temp. diagrams for the 3 binary systems NbCl_5 - NaCl , ZrCl_4 - NaCl , and NbCl_5 - ZrCl_4 were constructed. The system NbCl_5 - NaCl has an incongruently melting compd., $\text{NaCl} \cdot \text{NbCl}_5$, the temp. at the peritectic transformation is 436° and the temp. of the polymorphic transformation of this compd. is 256° . ZrCl_4 and NaCl form a congruently melting compd., $2\text{NaCl} \cdot \text{ZrCl}_4$, m. 695° , which exists in 3 modifications. The eutectic formed from $2\text{NaCl} \cdot \text{ZrCl}_4$ and ZrCl_4 , m. 511° , contains 12% NaCl and 88% ZrCl_4 ; the eutectic formed from $2\text{NaCl} \cdot \text{ZrCl}_4$ and NaCl , m. 539° , contains 48% NaCl and 52% ZrCl_4 . NbCl_5 and ZrCl_4 form an ordinary eutectic, 186° , contg. 31% ZrCl_4 and 69% NbCl_5 . The liquidus and fields of existence for NaCl , ZrCl_4 , NbCl_5 , $\text{NaCl} \cdot \text{NbCl}_5$, and $2\text{NaCl} \cdot \text{ZrCl}_4$ were detd.; there were found: a peritectic point having the compn. 64.9% NbCl_5 , 15.4% ZrCl_4 , and 20.4% NaCl with a transformation temp. of 251° ; a eutectic point at 79.3% NbCl_5 , 18.7% ZrCl_4 , and 11.0% NaCl , m. 198° ; and a eutectic point at 66.7% NbCl_5 , 28.1% ZrCl_4 , and 5% NaCl , m. 184° . These results of thermal analysis, checked by tensiometric analysis, are combined in a triangular diagram with isotherms marked and with 5 separate sections shown as binary plots.

V. H. Gottschalk

gruently melting compound NaTaCl_6 (V) was revealed in the system I - II, its temperature of peritectic transformation

USSR/Physical Chemistry - Thermodynamics, Thermochemistry,
Equilibria, Physical-Chemical Analysis, Phase Transitions.

B-8

Abs Jour : Ref Zhur - Khimiya, No 1, 1958, 405

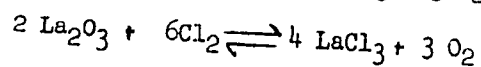
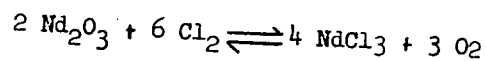
is 470° and its temperature of polymorphous transformation is 232°. The liquidus fields of the systems I - II - III and II - III - IV were plotted; the fields of primary crystallization of the compounds were determined. The tensimetric study of these systems by the flow method showed that the thermic stability of the chemical compounds V, NaNbCl_6 (VI) and NaAlCl_6 was not the same. The changes of free energy at the reactions of thermal dissociation of V and VI at 200 to 400° were determined using the obtained data. The formation of solid solutions I-II and III-IV was established tensimetrically.

Card 2/2

KORSHUNOV, B.G.

"Interaction of the Oxides of Neodymium and Lanthanum With Gaseous Chlorine," by I. S. Morozov and B. G. Korshunov, Zhurnal Neorganicheskoy Khimii, Vol 1, No 11, Nov 56, pp 2606-2612

The chlorination of the oxides of neodymium and lanthanum at the temperatures of 200°, 250°, and 300° was investigated. The equilibrium constants and changes of free energy in the reactions



were determined at these temperatures. In the introduction explaining the purpose of the work, it is pointed out that considerable interest in the chlorination processes and the properties of metal chlorides is evinced in metallurgy at present, because chlorides can be prepared easily from metal oxides and other compounds, have low melting points, and are highly volatile, so that metals can be separated by taking advantage of this volatility. (U)

sum. 1322

Korshunov, B. G.

USSR/Physical Chemistry -- Thermodynamics, Thermochemistry, Equilibria,
Physical Chemical Analysis, Phase Transitions.

B-8

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3815.

Author : B.G. Korshunov, N.A. Sil'vestrova.

Inst : Moscow Institute of Fine Chemical Technology.

Title : Study of Interaction Between Niobium Pentachloride and
Zirconium Tetrachloride with Magnesium Chloride in Melts.

Orig Pub: Tr. Mosk. in-ta tonkoy khim. tekhnol, 1956, vyp. 6, 21-25.

Abstract: The fusibility graphs of the NbCl_5 - MgCl_2 and ZrCl_4 - MgCl_2 systems were studied. The solubility of MgCl_2 in melted NbCl_5 and ZrCl_4 is very little. The eutectic of the 1st system is at 97% of NbCl_5 and 192° ; the eutectic of the 2nd system is at 98.5% of ZrCl_4 and 426° . NbCl_5 and ZrCl_4 do not dissolve in melted MgCl_2 . The vapor pressure of NbO_5 on the melted mixture of 30% by weight of MgCl_2 and 70% by weight of NbO_5 determined by the flow method (chlorine the carrier) is approximately equal

Card : 1/2

-50-

USSR/Physical Chemistry - Thermodynamics, Thermochemistry, Equilibria,
Physical-Chemical Analysis, Phase Transitions.

B-8

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3815.

to the NbCl_5 vapor pressure at the corresponding temperature,
which indicates the possibility of a complete separation of
 NbCl_5 and ZrCl_4 from MgCl_2 by sublimation.

Card : 2/2

-51-

AUTHORS: Morozov, I. S., Korshunov, B. G. 20-119-3-36/65

TITLE: On the Problem of the Thermodynamics of the Chlorination of the Rare-Earth Metal Oxides by Gaseous Chlorine (K voprosam termodinamiki khlorigirovaniya okislov redkozemel'nykh metallov gazoobraznym khlorom)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 3, pp. 523-525 (USSR)

ABSTRACT: This work is a continuation of the investigations by the authors on the thermodynamics and on the chemistry of the interaction of the rare-earth metal oxides with gaseous chlorine (reference 1,2). The equilibrium of the reactions of the type $4MeCl_3(solid) + 3O_2(gaseous) \rightleftharpoons 2Me_2O_3(solid) + 6Cl_2(gaseous)$ was investigated, whereby Me denotes Sc, La, Nd, or Sm. The investigations were made on the conditions of the two-sided equilibrium, i.e. from the side chloride-oxygen and from the side oxide-chlorine. The preparations for the production of the metallic chlorides were placed to disposal by I. N. Zaozerskiy. The equilibrium of the gases was determined by the statistical method. The analysis took place in a thermostat glass buret. In the investigation of the equi-

Card 1/3

On the Problem of the Thermodynamics of the Chlorination of 20-119-3-36/65
the Rare-Earth Metal Oxides by Gaseous Chlorine

The values of $\lg K_r = f(1/T)$ sufficiently exactly are on straight lines. According to the results, which were obtained here, the similar physical and chemical properties condition the resemblances of the thermodynamic properties. There are 2 figures, 1 table, and 4 references, which are Soviet.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii im. N. S. Kurnakova
(Institute of General and Inorganic Chemistry ~~imeni~~ N.S. Kurnakov)

PRESENTED: November 16, 1957, by I. I. Chernyayev, Member, Academy of Sciences, USSR

SUBMITTED: November 11, 1957

AVAILABLE: Library of Congress

Card 3/3

. 5(4).

AUTHORS: Morozov, I. S., Korshunov, B. G., Kokorev, V. V., Ionov, V. I. SOV/153-2-4-3/32

TITLE: Thermal and Tensimetical Investigation of the System $\text{NbCl}_5\text{-FeCl}_3\text{-NaCl}$

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1959, Vol 2, Nr 4, pp 485 - 489 (USSR)

ABSTRACT: The investigation of the subject mentioned in the title is of interest with regard to the preparation of easily fusible melts containing niobium as well as to the purification of NbCl_5 from FeCl_3 . The system mentioned in the title is part of the quaternary system $\text{NbCl}_5\text{-FeCl}_3\text{-AlCl}_3\text{-NaCl}$. A thorough investigation of the latter will make it possible to produce melts with a crystallization temperature lower than that of the adjacent ternary systems (Ref 2). In the treatment of raw material containing niobium by chlorine a simpler condensation device is sufficient for easily fusible melts. The binary lateral systems adjacent to the system mentioned in the title have already been investigated earlier (Refs 3-5). In order to investigate the ternary system, five inner sections were made, and several mixtures determined

Card 1/3

Thermal and Tensimetical Investigation of the System NbCl_5 - FeCl_3 - NaCl SOV/153-2-4-3/32

which do not form independent sections. Tables 1 and 2 show the results. The crystallization of the melts the figurative points of which are in the triangle NbCl_5 - FeCl_3 - NaFeCl_4 in the phase diagram is concluded in the triple eutectic point E_3 ; the solid alloys consist of the phases NbCl_5 , FeCl_3 and NaFeCl_4 . The tensimetical investigation of the system mentioned in the title was supposed to prove the results of the thermal analysis mentioned above. Moreover, the possibility of separating niobium chloride and iron chloride was to be examined. For this purpose, the vapor tensions over the mixtures of NbCl_5 , FeCl_3 and NaCl were determined between 130 and 320°. For method and apparatus see reference 3. A table (without number) shows the composition of these mixtures in mol%. The results are shown in table 1 and figure 3. The results of the thermal analysis were proved by tensimetical investigations of the system mentioned in the title. Moreover, the possibility of separating niobium chloride and iron chloride by means of fractional distillation in the presence of NaCl was proved. In addition, vessels by Stepanov were mentioned in the paper.

Card 2/3

Thermal and Tensimetical Investigation of the System SOV/153-2-4-3/32
 $\text{NbCl}_5\text{-FeCl}_3\text{-NaCl}$

There are 3 figures, 1 table, and 6 references, 5 of which are Soviet.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni M. V. Lomonosova, Kafedra tekhnologii redkikh i rasseyarnykh elementov (Moscow Institute of Fine Chemical Technology imeni M. V. Lomonosov, Chair of Technology of Rare and Dispersed Elements)

SUBMITTED: April 28, 1958

Card 3/3

5(4)
AUTHORS: Morozov, I. S., Ionov, V. I., Korshunov, B. G. SOV/78-4-6-41/44
TITLE: Thermal Analysis of the System $\text{NdCl}_3\text{-MgCl}_2\text{-KCl}$ (Termicheskiy analiz sistemy $\text{NdCl}_3\text{-MgCl}_2\text{-KCl}$)
PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 6, pp 1457 - 1458 (USSR)
ABSTRACT: The system $\text{NdCl}_3\text{-MgCl}_2\text{-KCl}$ was investigated by the method of the thermal analysis; the phase diagram was constructed and is shown in figure 1. 7 internal sections were investigated in the three-component system. It was found that 7 regions of primary crystallization are formed on the surface of the liquidus corresponding to the compounds KCl , NdCl_3 , MgCl_2 , K_3NdCl_6 , K_2NdCl_6 , KCl.MgCl_2 and 2KCl.MgCl_2 . The four-phase equilibrium in the system $\text{NdCl}_3\text{-MgCl}_2\text{-KCl}$ is given in a table. The existence of the compound 2KCl.MgCl_2 was confirmed in the system $\text{MgCl}_2\text{-KCl}$. There are 1 figure, 1 table, and 6 references, 4 of which are Soviet.

Card 1/2

S/149/60/000/003/010/012/XX
A006/A001

AUTHORS: Ionov, V.I., Korshunov, B.G., Kokorev, V.V., Marozov, I.S.

TITLE: Physical and Chemical Study on Interaction of Thorium Chloride
With Chlorides of Alkali-Metals and Cerium in Melts

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya,
1960, No. 3, pp. 102-108

TEXT: Literature data on thorium chloride chemistry are incomplete and obsolete. The authors investigated the interaction of thorium chloride with chlorides of sodium, potassium, cesium and cerium in melts, for the purpose of completing the knowledge about the physical and chemical nature of some technological processes of thorium chloride preparation. Thorium chloride was prepared by chlorination of thorium dioxide mixed with charcoal from sugar, by gaseous chlorine at 1,000-1,050°C. The melting temperature of the chloride obtained was 750°C. Vapor tension of thorium chloride corresponding to its melting temperature was about 80 mm Hg. Cerium chloride was prepared by the method described in Reference 16. The melting temperatures of chlorides of sodium, potassium, cesium and cerium were 800, 776, 646 and 802°C, respectively. The chloride systems

Card 1/4

S/149/60/000/003/010/012/XX
A006/A001

Physical and Chemical Study on Interaction of Thorium Chloride With Chlorides of Alkali-Metals and Cerium in Melts

were studied by thermal and tensimetric analyses. The thermal analysis was made by differential and plain recording of heating and cooling curves on a N.S. Kur-nakov pyrometer. The temperature was measured with a platinum-platinum rhodium thermocouple graduated according to conventional datum points. Melting of the salt mixtures and recording of curves was made in quartz glass Stepanov containers. After filling the container with the salt mixture, the air was evacuated by a dry hydrogen chloride current. The container was then sealed and placed in a furnace. The cooling rate was 4-10°C per minute, depending on the temperature range. It was established that in the $\text{ThCl}_4\text{-MCl}$ systems the components formed chemical compounds of the MeThCl_5 , Me_2ThCl_6 , Me_3ThCl_7 type (excepted the $\text{ThCl}_4\text{-NaCl}$ system). The NaThCl_5 system melts incongruently at 370°C, KThCl_5 and CsThCl_5 melt congruently at 428 and 490°C respectively. Na_2ThCl_6 melts congruently at 360°C; K_2ThCl_6 and CsThCl_6 melt incongruently at 406 and 573°C respectively; K_3ThCl_7 and Cs_3ThCl_7 melt congruently at 705 and 720°C respectively. Data obtained by thermal analysis are confirmed by tensimetric investigation of the system. The tensimetric analysis was made by the dynamic method. The determination of chloride vapor tension was conducted in chlorine atmosphere. The amount of the initial

Card 2/4

3/149/60/000/003/010/012/XX
A006/A001

Physical and Chemical Study on Interaction of Thorium Chloride With Chlorides of Alkali-Metals and Cerium in Melts

mixture in all experiments was about 30 g. The salt mixtures were melted in sealed ampoules cooled, crushed in argon atmosphere, and placed into the apparatus. The amount of chlorine passed was determined from the increase in weight of the potash bulbs filled with 25% NaOH solution. The rate of the chlorine current was sufficient to saturate the volatile chlorides. The quantity and composition of the sublimate were determined by chemical analysis and the pressure in the apparatus by the sum of atmospheric and excess pressure obtained when the gas passed through the absorption flasks. A formula is given to calculate the partial vapor tension of the mixture components, and values of vapor tension of thorium chloride over Na_2ThCl_6 , K_3ThCl_7 and Cs_3ThCl_7 at various temperatures are given. It was established that the thermal stability of thorium chloride combined with alkali metal chlorides changed regularly, increasing from sodium chloride to cesium chloride. The method of thermal analysis was used to study fusibility of the systems $\text{ThCl}_4 - \text{CeCl}_3$ and $\text{ThCl}_4 - \text{CeCl}_3 - \text{NaCl}$, which was shown on fusibility

Card 3/4

S/153/60/003/003/010/036/XX
B016/B058

AUTHORS: Korshunov, B. G., Morozov, I. S., Ionov, V. I.

TITLE: Study of the Interaction of the Chlorides of Rare Earths
With the Chlorides of the Alkaline-earth- and Alkali
Metals in Melts. Thermal Analysis of the System
 $\text{CeCl}_3 - \text{CaCl}_2 - \text{NaCl}$

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i
khimicheskaya tekhnologiya, 1960, Vol. 3, No. 3,
pp. 402 - 404

TEXT: The authors report on the thermographic analysis of the fusibili-
ty of the two binary systems $\text{CeCl}_3 - \text{CaCl}_2$ and $\text{CeCl}_3 - \text{NaCl}$ in the ter-
nary system $\text{CeCl}_3 - \text{CaCl}_2 - \text{NaCl}$. The nonvolatile melt which develops
on treating lopafite raw material by means of the chlorine method, is
composed of these three chlorides. The chlorides dehydrated by the au-
thors were molten in quartz-glass containers according to Stepanov (not
described in the text). Apart from the two binary systems, the authors

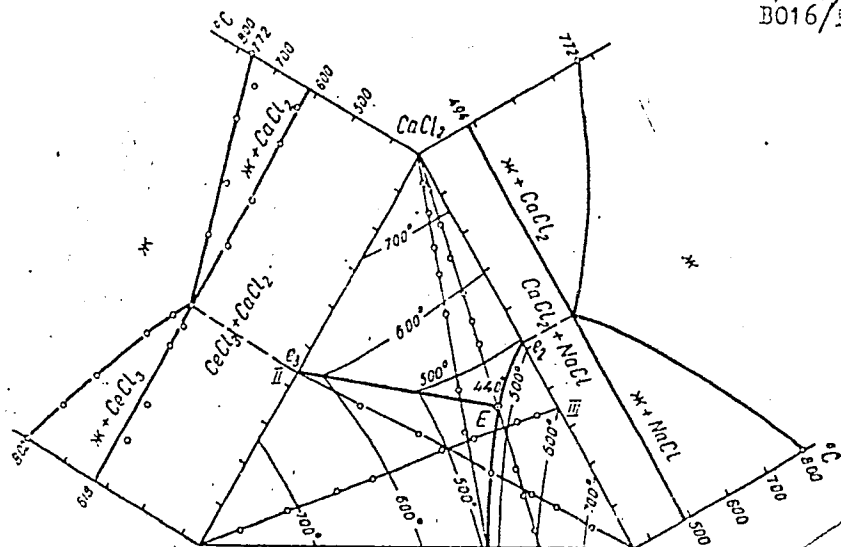
Card 1/4

Study of the Interaction of the Chlorides S/153/60/003/003/010/036/XX
of Rare Earths With the Chlorides of the BO16/BO58
Alkaline-earth- and Alkali Metals in Melts.
Thermal Analysis of the System CeCl_3 - CaCl_2 - NaCl

studied four inner sections, the directions of which are mentioned in the Fig. on p. 404. On the basis of their results, the authors state that three crystallization fields of CeCl_3 , CaCl_2 , and NaCl exist on the liquidus surface. The components of all the three systems mentioned form a fusibility diagram of the eutectic type. The ternary eutectic consists of CeCl_3 12.2; CaCl_2 38.8; NaCl 49.0 (in mole%) and crystallizes at 440°C . The eutectics CeCl_3 - CaCl_2 and CeCl_3 - NaCl contain (in mole%): 55.0 and 32.5 CeCl_3 , respectively, and melt at 618° and 488°C , respectively. There are 1 figure, 1 table, and 6 references: 4 Soviet, 1 British, and 1 German.

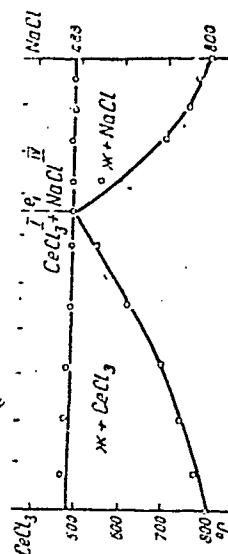
Card 2/4

S/153/60/003/003/010/036/XX
B016/3058



Legend to Fig. p. 404: X - liquid

Card 4/4



KORSHUNOV, B.G.; MOROZOV, I.S.; IONOV, V.I.; ZORINA, M.A.

Physicochemical investigation of the system $\text{AlCl}_3 - \text{FeCl}_3 - \text{H}_2\text{O}$.
Izv. vys. ucheb. zav.; tsvet. met. 3 no.5:67-71 '60.
(MIRA 13:11)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii. Kafedra
khimii i tekhnologii redkikh i rasseyannykh elementov.
(Phase rule and equilibrium)
(Systems (Chemistry))

KORSHUNOV, B.G.; IONOV, V.I.; BAKLASHOVA, T.A.; KOKOREV, V.V.

Studying the interaction of thorium chloride with the chlorides of magnesium, calcium, cerium, aluminum, iron, niobium, tantalum and niobium oxychloride in the molten state. Izv. vys. ucheb. zav.; tsvet. met. 3 no. 6:115-118 '60. (MIRA 14:1)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii. Kafedra khimii i tekhnologii redkikh i rasseyannykh elementov.
(Chlorides) (Vapor-liquid equilibrium)

86938

S/149/60/000/006/010/018
A006/A001

213000

AUTHORS: Korshunov, B. G., Ionov, V. I., Baklashova, T. A., Kokorev, V. V.

TITLE: An Investigation of Interactions Between Thorium Chlorides and Chlorides of Magnesium, Calcium, Cerium, Aluminum, Iron, Niobium, Tantalum and Oxychloride of Niobium in Melts

PERIODICAL: Izvestiya vysshikh shkolnykh zavedeniy, Tsvetnaya metallurgiya, 1960, No. 6, pp. 114-118

TEXT: The extended use of chlorine methods for processing complex rare-element raw materials containing thorium, requires a study of the systems with the participation of thorium chloride. The authors carried out thermal and tensiometrical analyses to investigate the interaction of components in the following systems: $\text{ThCl}_4 - \text{MgCl}_2$, $\text{ThCl}_4 - \text{CaCl}_2$, $\text{ThCl}_4 - \text{CeCl}_3$, $\text{ThCl}_4 - \text{AlCl}_3$, $\text{ThCl}_4 - \text{FeCl}_3$, $\text{ThCl}_4 - \text{NbCl}_5$, $\text{ThCl}_4 - \text{TaCl}_5$, $\text{ThCl}_3 - \text{FeCl}_3 - \text{NbCl}_5$ and $\text{ThCl}_4 - \text{NbOCl}_3$. The chlorides were obtained as follows: chloride of thorium by chlorinating a mixture of thorium dioxide and charcoal from sugar with gaseous chlorine at 1000°C ; chlorides of aluminum, iron and tantalum were prepared by chlorination of metals; chlorides of magnesium, calcium and cerium were obtained by the method indicated

Card 1/6

86908

S/149/60/000/006/010/018

A006/A001

An Investigation of Interactions Between Thorium Chlorides and Chlorides of Magnesium, Calcium, Cerium, Aluminum, Iron, Niobium, Tantalum and Oxychloride of Niobium in Melts

in reference 5, and oxychloride of niobium by a method described in reference 6. The thermal analysis of the systems was made by the method of fusibility; the curves were recorded on a N. S. Kurnakov pyrometer. The ThCl_4 - MgCl_2 , ThCl_4 - CaCl_2 and ThCl_4 - CeCl_3 systems have a fusibility diagram of the eutectic type (Figure 1). The eutectics contain 55.0 molecular % (82.8 weight %), 46.0 mol. % (74.2 weight %) and 60.6 mol. % (70.0 weight %) ThCl_4 respectively and melt at 610, 560 and 640°C. To confirm data obtained by thermal analysis and to reveal the possibility of separating and refining the chlorides, the authors carried out a tensiometric study of the aforementioned systems based on the measurement of vapor tensions over the systems, which were determined by the "flow" method. Chlorine was used as a carrier gas. Thorium in the sublimate was determined by a method given in Ref. 8 and 9 and the other elements by conventional methods. The method of tensiometry has been described in Ref. 10. The absence of a chemical reaction between the components and the difference in the vapor tensions can be used for the separation of chlorides by distillation.

Part 2/6

86938

S/149/60/000/006/010/012
A006/A001

An Investigation of Interactions Between Thorium Chlorides and Chlorides of Magnesium, Calcium, Cerium, Aluminum, Iron, Niobium, Tantalum and Oxychloride of Niobium in Melts

The results of the tensiometric investigation are given below:

System	Content of ThCl ₄ in the mixture in mol. %	°C	Vapor tension over the system $\lg P = -\frac{A}{T} + B$, mm Hg		
			A	B	for chlorides
ThCl ₄ - MgCl ₂	22.9	700 - 820	6260	6.84	ThCl ₄
ThCl ₄ - CaCl ₂	54.0	575 - 819	7210	8.26	"
ThCl ₄ - CeCl ₃	40.5	725 - 895	5700	6.53	"
ThCl ₄ - AlCl ₃	27.9	114 - 152	5020	13.7	Al ₂ Cl ₆
ThCl ₄ - FeCl ₃	22.9	228 - 267	5825	12.5	Fe ₂ Cl ₆
ThCl ₄ - NbCl ₅	22.9	125 - 193	3300	9.16	NbCl ₅
ThCl ₄ - TaCl ₅	22.9	100 - 132	3660	8.57	NbOCl ₃
ThCl ₄ - NbOCl ₃	22.9	110 - 192	3710	9.90	TaCl ₅

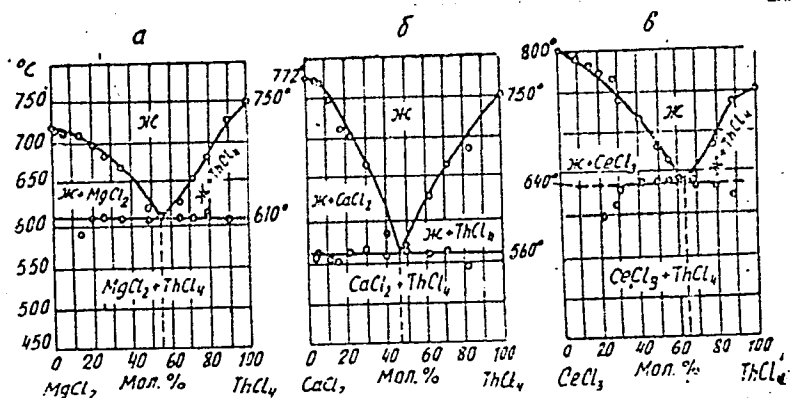
86938

S/149/60/000/006/010/018

A006/A001

An Investigation of Interactions Between Thorium Chlorides and Chlorides of Magnesium, Calcium, Cerium, Aluminum, Iron, Niobium, Tantalum and Oxychloride of Niobium in Salts

Figure 1:
Possibility diagram of
the systems ThCl_4 -
 MgCl_2 (a); ThCl_4 -
 CaCl_2 (b) and
 ThCl_4 - CeCl_3 (c).



Card 4/6

86938

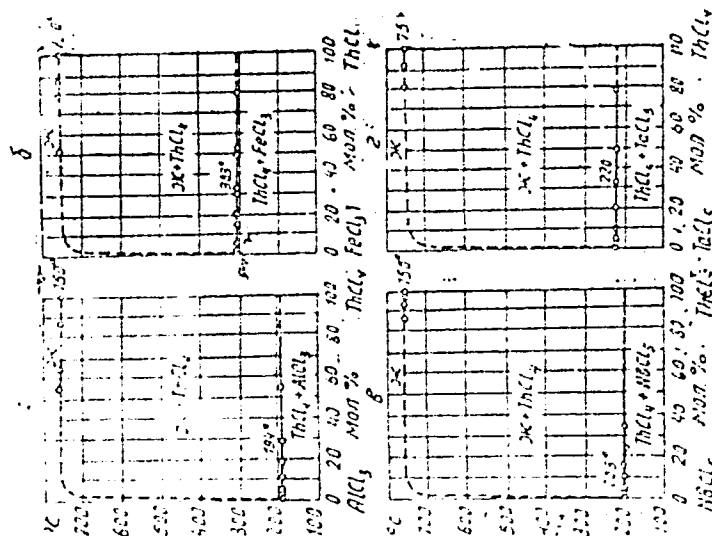
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ACC6/A001

Investigation of Interactions Between Thorium Chlorides and Chlorides of Magnesium, Calcium, Cerium, Aluminum, Iron, Niobium, Tantalum and Oxychloride of Niobium in Melts.

Figure 2:
Melting diagram of the system $\text{ThCl}_4 - \text{AlCl}_3$ (a), $\text{ThCl}_4 - \text{FeCl}_3$ (b), $\text{ThCl}_4 - \text{NbCl}_5$ (c), and $\text{ThCl}_4 - \text{TaCl}_5$ (d).

There are 4 figures and 10 references: 6 Soviet, 2 French, 1 German, 1 English



86938

S/149/60/000/006/010/012

A006/A001

An Investigation of Interactions Between Thorium Chlorides and Chlorides of Magnesium, Calcium, Cerium, Aluminum, Iron, Niobium, Tantalum and Oxychloride of Niobium in Melts

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii (Moscow Institute of Fine Chemical Technology) Kafedra khimii i tekhnologii redkikh i rasseyannykh elementov (Department of Chemistry and Technology of Rare and Dispersed Elements)

SUBMITTED: January 28, 1960

Card 6/6

S/078/60/005/06/09/030
B004/B014

AUTHORS: Ionov, V. I., Morozov, I. S., Korshunov, B. G.

TITLE: Thermal Analysis of the Systems NdCl_3 - FeCl_2 ,
 FeCl_2 - NaCl , FeCl_2 - KCl , FeCl_2 - CsCl , and
 NdCl_3 - FeCl_2 - KCl

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 6,
pp. 1248 - 1253

TEXT: The authors specify the following data obtained from experiments: ✓B
melting-point diagram of the system NdCl_3 - FeCl_2 with a eutectic at
608°C and 59.8 mole % FeCl_2 (Fig. 1); melting-point diagram of the system
 FeCl_2 - NaCl with a eutectic at 370°C and 44 mole % FeCl_2 (Fig. 2); melt-
ing-point diagram of the system FeCl_2 - KCl (Fig. 3). The compounds
 KFeCl_3 (α - and β -modification) and K_2FeCl_4 are formed in the latter. The

Card 1/3

Thermal Analysis of the Systems $\text{NdCl}_3 - \text{FeCl}_2$, S/078/60/005/06/09/030
 $\text{FeCl}_2 - \text{NaCl}$, $\text{FeCl}_2 - \text{KCl}$, $\text{FeCl}_2 - \text{CsCl}$, and B004/B014
 $\text{NdCl}_3 - \text{FeCl}_2 - \text{KCl}$

eutectic $\text{KFeCl}_3 + \text{K}_2\text{FeCl}_4$ melts at 340°C and corresponds to a content of 39.8 mole % FeCl_2 . The eutectic $\text{KFeCl}_3 + \text{FeCl}_2$ melts at 380°C with a content of 52.2 mole % FeCl_2 . In the system $\text{FeCl}_2 - \text{CsCl}$ (Fig. 4), the compounds CsFeCl_3 and Cs_2FeCl_4 arise with the eutectics $\text{Cs}_2\text{FeCl}_4 + \text{CsCl}$ (508° , 21.4 mole % FeCl_2), $\text{CsFeCl}_4 + \text{CsFeCl}_3$ (522° , 38.0 mole % FeCl_2), and $\text{CsFeCl}_3 + \text{FeCl}_2$ (498°C , 69.3 mole % FeCl_2). Hence, the thermal stability of compounds of FeCl_2 with alkali chlorides increases from Na to Cs. Eight sections were examined in the system $\text{NdCl}_3 - \text{FeCl}_2 - \text{KCl}$ (Figs. 5-11). ✓B

The melting-point diagrammatically shown in Fig. 12 was constructed on the strength of these results. Numerous conversions were detected below the liquidus surface. Data on the four ternary eutectic points and one

Card 2/3

Thermal Analysis of the Systems $\text{NdCl}_3 - \text{FeCl}_2$: S/078/60/005/06/09/030
 $\text{FeCl}_2 - \text{NaCl}$, $\text{FeCl}_2 - \text{KCl}$, $\text{FeCl}_2 - \text{CsCl}$, and B004/B014
 $\text{NdCl}_3 - \text{FeCl}_2 - \text{KCl}$

ternary peritectic point are supplied. There are 12 figures and
4 references: 2 Soviet and 2 American.

✓B

Card 3/3

S/149/61/000/002/010/017
A006/A001

AUTHORS: Korshunov, B.G., Ionov, V.I.

TITLE: Investigating the Density, Viscosity and Electric Conductivity of the TiCl_3 - TiCl_2 - NaCl System

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya, 1961, No. 2, pp. 102 - 106

TEXT: The authors studied density, viscosity and electric conductivity of melts of lower titanium and sodium chlorides, used as electrolyte in titanium refining. To determine the density of the TiCl_3 - TiCl_2 -NaCl system the authors used the equipment and method described in Reference 4. The composition of the salt mixtures was based on samples of composition: 1) 62.2% TiCl_3 , 6.7% TiCl_2 , and 3.1% NaCl and 2) - 6.4% TiCl_3 , 12.9% TiCl_2 and 80.7% NaCl, obtained by sodium-thermal reduction of titanium tetrachloride and subsequent dilution of the reduction product with sodium chloride. In the TiCl_3 - TiCl_2 -NaCl system the density of melts was studied which contained 2.5; 4.0; 6.8; 7.2; 9.1 and 21.85 weight % of total soluble titanium, in the 850-1,050°C temperature range with intervals of 50°C. Simultaneously, the density of NaCl melts was determined. It appeared that

Card 1/5

S/149/61/000/002/010/017
A006/A001

Investigating the Density, Viscosity and Electric Conductivity of the TiCl_3 - TiCl_2 -NaCl System

the density of melts in the system fluctuated from 1.430 g/cm³ for NaCl at 1,050°C to 1,833 g/cm³ for a mixture with 21.85% Ti_{total} at 850°C. At equal temperatures, the density of melts increased with a higher content of Ti_{total} . Results are given in Table 1. The density of solidified specimens at 20°C was determined with the aid of benzene (specific weight 0.747 g/cm³). Density increased with higher total Ti content and was 2.115 g/cm³ for NaCl and 2.352 g/cm³ for a melt containing 21.85% Ti_{tot} . Density of Ti chlorides (according to Ref. 5) is 2.65 g/cm³ for TiCl_3 and 3.13 g/cm³ for TiCl_2 . The results show that the density of the system increases with a higher content of titanium tetrachloride. The viscosity of the system was determined by the method of a torsion pendulum. The material was placed in a crucible and in a electric furnace under whose roof dry argon current was switched on. The stainless steel balls (65 - 75 g weight) of the torsion pendulum were suspended on a molybdenum thread of 0.104 diameter and 120 mm length. Preliminary determinations were made of logarithmic decrements in air and liquids of known density and viscosity (water and molten sodium chloride). The viscosity of a melt with 7.2% total titanium content (6.4% TiCl_3 ; 12.9% TiCl_2 ; 80.7% NaCl)

Card 2/5

S/149/61/000/002/010/017
A006/A001Investigating the Density, Viscosity and Electric Conductivity of the TiCl_3 - TiCl_2 -NaCl System

at 800°C was 0.028 poise. Elevation of temperature entailed the accumulation of solid oxide particles in the melts and distortion of results. As a rule, the viscosity of molten salts decreases rapidly with higher temperatures, which corresponds to a reduced interaction force of salt ions. A slight decrease of viscosity was observed at a lower concentration of lower titanium chlorides; this is in agreement with the concepts on the effect of the mobility of cations on the viscosity of melts. Electroconductivity of the system was studied on melts containing up to 9.2% titanium chlorides, in the 820 - 950°C range. The method and equipment, described in Reference 6, were used. It was found that the electroconductivity of the system decreased at the given temperatures at a concentration of titanium chlorides raised from 0 to 9.2%, and increased with higher temperatures. The results must however be considered as approximate, since it was stated that the platinum electrodes employed for the experiments were partially dissolved in the electrolyte.

Card 3/5

S/149/61/000/002/010/017
A006/A001Investigating the Density, Viscosity and Electric Conductivity of the TiCl_3 - TiCl_2 -NaCl SystemTable 1: Results of measuring the density in the TiCl_3 - TiCl_2 -NaCl System

Состав системы, вес. % a				Плотность расплава (г/см ³) при температуре b					Значения коэффициента α в зависимости от температуры $\alpha_t = \alpha_{850} - \alpha(t - 850)$ с
TiCl_3	TiCl_2	NaCl	$\text{Ti}_{\text{общ}}$	850°	900°	950°	1000°	1050°	
—	—	100,0	—	1,527	1,502	1,478	1,454	1,430	$4,85 \cdot 10^{-4}$
2,2	4,5	93,3	2,5	1,549	1,522	1,495	1,468	1,440	$5,45 \cdot 10^{-4}$
3,6	7,2	89,2	4,0	1,570	1,541	1,510	1,482	1,455	$5,07 \cdot 10^{-4}$
6,1	12,2	81,7	6,8	1,599	1,572	1,545	1,520	1,486	$5,65 \cdot 10^{-4}$
6,4	12,9	80,7	7,2	1,604	1,577	1,552	1,527	1,498	$5,3 \cdot 10^{-4}$
8,1	16,3	75,6	9,1	1,628	1,600	1,588	1,540	1,511	$5,85 \cdot 10^{-4}$
62,2	6,7	31,1	21,85	1,833	1,750	1,660	1,600	1,545	$1,42 \cdot 10^{-3}$

Card 4/5

S/149/61/000/002/010/017
A006/A001

Investigating the Density, Viscosity and Electric Conductivity of the $TiCl_3$ - $TiCl_2$ -
NaCl System

Table 1:

- a) Composition of system in weight %
- b) Density of melt (g/cm^3) at temperature
- c) Value of coefficient α in relation: $d_t = d_{850} - \alpha (t - 850)$
- d) Density at 20 C g/cm^3 .

There are 2 tables and 6 references: 3 Soviet and 3 non-Soviet.

ASSOCIATIONS: Moskovskiy institut tonkoy khimicheskoy tekhnologii (Moscow Institute of Fine Chemical Technology). Kafedra khimii i tekhnologii redkikh i rasseyannykh elementov (Department of Chemistry and Technology of Rare and Dispersed Elements)

SUBMITTED: June 26, 1960

Card 5/5

Table 1
Cont.

Плотность при 20° g/cm^3 d						
	2,115	2,126	2,138	2,163	2,184	2,201
						2,252

S/149/61/000/001/003/013
A006/A001

AUTHORS: Korshunov, B.G., Ionov, V.I.

TITLE: Study of Fusibility of the NiCl_3 - TiCl_2 -NaCl System

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya, 1961, No. 1, pp. 77 - 81

TEXT: Previous studies (Ref. 1, 2, 3, 4) on titanium refining by electrolysis using crude Ti as soluble anodes, do not contain indications on the optimum composition of the electrolyte, due to the lack of information on its physico-chemical properties. The authors investigated the most important physico-chemical properties of the TiCl_3 - TiCl_2 -NaCl system. Fusibility of the system was as yet not studied but its components binary systems, had been investigated by a number of authors. Data on the TiCl_2 -NaCl system had been submitted by K. Komarek and P. Gerasymenko (Ref. 5); the TiCl_3 -NaCl system has been studied by V.M. Kamenetskiy (Ref. 6), B.F. Markov and R.V. Chernov (Ref. 7), P. Ehrlich, G. Kaupa, K. Blankenstein (Ref. 8), and M. Farber, A.J. Darnell, F. Brown (Ref. 9). The results obtained by the aforementioned authors disagree with regard to crystallization from melts for mixtures containing over 25 mol % TiCl_3 . The authors of the present

Card 1/6

Study of Fusibility of the $\text{TiCl}_3\text{-TiCl}_2\text{-NaCl}$ SystemS/149/61/000/001/003/013
A006/A001

article studied fusibility of the $\text{TiCl}_3\text{-NaCl}$ system and of the $\text{TiCl}_3\text{-TiCl}_2\text{-NaCl}$ system within the concentration range of lower titanium chlorides determined by the electrolyte composition for Ti refining. Trichloride of Ti was obtained by reducing tetrachloride of Ti with Ti metal by a method described in Ref. 10. Sodium chloride was preliminarily remelted. Investigations of fusibility were carried out by the method of thermal analysis; the curves were registered on a N.S. Kurnakov type pyrometer. The temperature was measured with a platinum-platinum rhodium thermocouple. Melting of the salt system was performed in Stepanov's quartz glass and in stainless steel containers. The salt mixtures were prepared by a method described in Reference 7. Cooling curves were obtained for molten mixtures containing up to 49.8 mol % (72.4 weight %) TiCl_3 . Results of thermal analysis, given in a diagram, are in agreement with data of Reference 8 and differ considerably from data of Reference 7 at a TiCl_3 concentration of over 25 mol.%. This is explained by the imperfect investigation method employed by Markov and Chernov, who melted the mixtures in open crucibles. According to data obtained by the present investigation, the components of the system form an incongruently melting Na_3TiCl_6 chemical compound; the temperature of peritectic transformation is 543°C . Eutectics, formed by the chemical compound and titanium trichloride, has a composition of 43 mol% TiCl_3 and 57% NaCl , and melts at 460°C . All the mixtures

Card 2/6

Study of Fusibility of the $TiCl_3$ - $TiCl_2$ -NaCl System

S/149/61/000/001/003/013
A006/A001

contained, after their melting, titanium dichloride whose content increased with a higher amount of titanium trichloride and attained 4 - 5% in weight. This shows that the system is not a strictly binary one. Fusibility of the ternary $TiCl_3$ - $TiCl_2$ -NaCl system was studied within a small range of lower titanium chloride concentrations. Previous studies had shown that in alkali metal melts, containing lower Ti chlorides, an equilibrium between bi- and trivalent titanium was established. Therefore samples of the following composition were used to compose the salt mixtures:

	$TiCl_3$	$TiCl_2$	NaCl
Sample 1	62.2	6.7	31.1
Sample 2	6.4	12.9	80.7

Sample 1 was prepared by sodium-thermal reduction of titanium tetrachloride in an amount required to obtain Ti trichloride. Sample 2 was obtained by sodium thermal reduction of titanium tetrachloride calculated to obtain Ti dichloride with subsequent dilution of the reduction product by sodium chloride. Results of thermal analysis and literature data on $TiCl_2$ -NaCl were used for the partial plotting of

Card 3/6

Study of Fusibility of the TiCl_3 - TiCl_2 -NaCl SystemS/149/61/000/001/003/013
A006/A001

the liquidus surface of the TiCl_3 - TiCl_2 -NaCl system (see diagram), which could only be obtained for the vertex of chlorous sodium if the TiCl_3 content in the mixture did not exceed 50 mol %. Data on the type of a phase diagram of the TiCl_3 - TiCl_2 system do not exist in literature. The boundary lines of the liquidus surface are approximate. The lowest melting temperature (about 443°C) is shown by a composition of 40 mol% TiCl_3 , 7% TiCl_2 and 53% NaCl. The phase diagram obtained of the TiCl_3 - TiCl_2 -NaCl system can be used to determine the temperature of beginning crystallization of electrolytes employed for the refining of titanium. ✓

*Moscow Inst. Fine Chem. Technology; Chair of Chemistry
and Technology of Rare and Dispersed Elements*

Card 4/6

KORSHUNOV, B.G.; IONOV, V.I.

Studying the density, viscosity and electric conductivity of the system $\text{TiCl}_3 - \text{TiCl}_2 - \text{NaCl}$. Izv. vys. ucheb. zav.; tsvet. met. 4 no.2:101-106 '61. (MIRA 14:6)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii, kafedra khimii i tekhnologii redkikh i rassseyannykh elementov.
(Titanium chloride)
(Chemistry, Metallurgic)

89905

S/078/61/006/003/020/022
B121/B208

52100

1043 1087 1273

AUTHORS: Korshunov, B. G., Safonov, V. V.

TITLE: Reaction of niobium tetrachloride with sodium chloride and potassium chloride

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 3, 1961, 753-754

TEXT: The reaction of niobium tetrachloride with the chlorides of sodium and potassium in the melt was studied. The chlorides of sodium and potassium were purified by remelting, and niobium tetrachloride was obtained from pentachloride by reduction with metallic niobium according to Ref. 3. The investigation was carried out by the melting method, by means of Kurnakov's pyrometer, and in Stepanov's quartz glass containers. The chemical compound Na_2NbCl_6 which melts congruently at 582°C was detected in the system NbCl_4 - NaCl . The α -modification is stable up to 365°C , and the β -modification of Na_2NbCl_6 above this point. The eutectic of this compound with 70 mole% NaCl melts at 530°C . The mixture of Na_2NbCl_6 and NbCl_4 with 33% NaCl has an eutectic which melts at 248°C . A chemical compound of the composition

Card 1/2

89905

S/078/61/006/003/020/022
B121/B208

Reaction of niobium ...

K_2NbCl_6 , melting at $782^{\circ}C$, was found in the system $NbCl_4 - KCl$. The mixture of K_2NbCl_6 with 68 mole% KCl forms an eutectic melting at $650^{\circ}C$. The eutectic resulting from K_2NbCl_6 and $NbCl_4$ with about 40 mole% KCl melts at $298^{\circ}C$. The reaction mixtures with more than 65 mole% $NbCl_4$ cannot be studied owing to disproportionation of $NbCl_4$. Fig. 1 gives the melting-point diagram of the system $NbCl_4 - NaCl$, and Fig. 2 that of the system $NbCl_4 - KCl$. There are 2 figures and 3 references: 1 Soviet-bloc.

SUBMITTED: October 6, 1960

Card 2/3

24731

S/078/61/006/007/008/014
B110/B202

54110

187530

AUTHORS: Korshunov, B. G., Gol'din, V. I.

TITLE: Fusibility in binary systems which are formed from tungsten hexachloride and molybdenum pentachloride with the chlorides of aluminum and iron

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 7, 1961, 1642 - 1644

TEXT: Owing to the high vapor tensions occurring in chlorides and oxy-chlorides of tungsten and molybdenum at the chlorination temperature, they are well suited for removing admixtures from the minerals. Since they contain, however, iron- and aluminum chloride impurities the authors studied the reaction of tungsten hexachloride and molybdenum chloride with aluminum and iron chlorides. This is of importance not only for the joint condensation of the chlorides, but also for the application of metallic W and Mo coatings by reduction from the gaseous chlorides. WCl_6 and $MoCl_5$ are produced according to Ref. 9(Rukovodstvo po preparativnoy neorganicheskoy khimii pod red. G. Brauera I. L. M., 1956). Melting temperatures:

Card 1/7

24731

S/078/61/006/007/008/014
B110/B202

Fusibility in binary systems...

$WCl_6 = 275^{\circ}C$; $MoCl_5 = 194^{\circ}C$; $AlCl_3 = 194^{\circ}C$; $FeCl_3 = 303^{\circ}C$. The cooling curves were recorded by means of a Kurnakovkov thermometer. The temperatures were measured by means of a Cr-Al thermocouple. Melting was done in Stepanov vessels which, after displacing the air by means of chlorine had been sealed and placed into the furnace. Owing to the chlorine atmosphere the thermal dissociation of WCl_6 and $MoCl_5$ was reduced. The portions added weighed 4-5g, the cooling rate was $3-5^{\circ}C/min$. As is shown in Fig. 1, a eutectic is formed in the system WCl_6-AlCl_3 at 46% by weight $AlCl_3$ and a melting temperature of $168 \pm 2^{\circ}C$. The points characterize the polymorphous transformation of WCl_6 at $222 - 174^{\circ}C$. In the concentration range $WCl_6 = 100 - 82\%$ primarily $\gamma-WCl_6$ -, between $82 - 62\%$, $\beta-WCl_6$ -, and between $62 - 54\%$, $\alpha-WCl_6$ crystals are separated. At a lower WCl_6 content $AlCl_3$ crystallizes primarily on undercooling of the melts which is also characteristic of $AlCl_3$. A tendency to undercooling is observed also in the eutectic. Melts with WCl_6 and $MoCl_5$ are dark brown. WCl_6 crystallization

Card 2/1

S/078/61/006/012/010/011
B124/B110

AUTHORS: Korshunov, B. G., Vyrskaya, L. A.

TITLE: Fusibility in the $WCl_6 - AlCl_3 - FeCl_3$ system

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 12, 1961, 2815-2816

TEXT: Chlorination techniques are being used for tungsten containing substances in industry in a continuously increasing scale. Formed chlorides and oxychlorides of tungsten with high vapor pressures at the chlorination temperature can be easily separated from the bulk of impurities which remain in the residue. It is most appropriate to chlorinate unconditioned and such materials, difficultly to be decomposed by other techniques. The condensation of $AlCl_3$ and $FeCl_3$, the vapor pressures of which are commensurable to that of WCl_6 takes place simultaneously with the condensation of WCl_6 . The binary systems limiting the above ternary system were described earlier (Ref. 1: B. G. Korshunov, V. I. Gol'din, Zh. neorgan. khimii 6, no. 7 (1961); Ref. 2: I. S. Morozov, Zh. neorgan. khimii 1, 2792 (1956)). Tungsten, aluminum and iron chlorides were prepared by

Card 1/1

Fusibility in the

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chlorination of the respective metals with gaseous chlorine. The melting point of WCl_6 is 275°C , that of AlCl_3 194°C , and that of FeCl_3 303°C .

The fusion curves of the mentioned system were recorded with a pyrometer of the type as developed by N. S. Kurnakov. The salt mixtures were fused and the fusion curves recorded in Stepanov crucibles made of refractory glass. The crucibles were sealed after filling with the salt mixture. Six internal cuts were studied in the WCl_6 - AlCl_3 - FeCl_3 system; experimental

data are given in the Figure. The solidification surface of the system consists of two fields corresponding to the primary separation of WCl_6 and of the AlCl_3 - FeCl_3 solid solution, respectively, from the melt. The

line dividing the crystallization fields connects the eutectic points of the binary lateral diagrams with a temperature of 224 and 168°C , respectively. There are 1 figure and 2 Soviet references [Abstracted notes. Complete translation]

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M. V. Lomonosova (Moscow Institute of Fine Chemical Technology imeni M. V. Lomonosov)

Card 2/0

Fusibility in the...

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B124/B110

SUBMITTED: May 25, 1961

Fig. Fusion diagram of the $WCl_6-AlCl_3-FeCl_3$ system.

Card 3/4 3

S/149/62/000/001/003/009
A006/A101

AUTHORS: Korshunov, B. G., Gol'din, V. I., Averkiyeva, L. A.

TITLE: Refining of tungsten hexachloride and molybdenum pentachloride from admixtures of iron and aluminum chlorides

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya, no. 1, 1962, 101 - 106

TEXT: For the purpose of simplifying the technology of chlorination methods in the reprocessing of tungsten and molybdenum-containing materials, tests were performed to refine gaseous WCl_6 and $MoCl_5$ from iron and aluminum chlorides. The methods of fusibility and tensometry were used to study the interaction of components in the WCl_6 -NaCl, WCl_6 -KCl, $MoCl_5$ -NaCl, $MoCl_5$ -KCl systems. The absence of a chemical interaction in the aforementioned systems on the one hand, and the possibility of formation of low-volatile compounds $Na(K)FeCl_4$ and $Na(K)AlCl_4$ on the other hand, was taken as a basis to develop a method of refining tungsten and molybdenum chlorides from $FeCl_3$ and $AlCl_3$ with the aid of alkali metals. The refining of WCl_6 and $MoCl_5$ was performed in a 40-mm diameter column filled with NaCl or KCl lumps (Figure 6). The refining conditions were estab-

Card 1/2

S/149/62/000/001/003/009
A005/A101

Refining of tungsten hexachloride and...

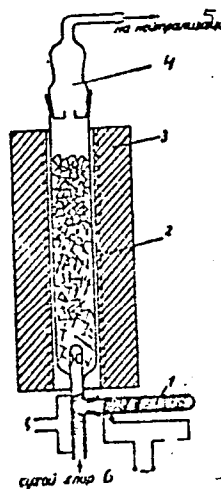
lished. The WCl_6 or $MoCl_5$ sublimate obtained by refining, contained less than 0.005% Fe_2O_3 and 0.003% Al_2O_3 per WO_3 or MoO_3 weight. There are 6 figures and 20 references, 18 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii (Moscow Institute of Fine Chemical Technology) Kafedra tekhnologii redkikh i rasseyannykh elementov (Department of the Technology of Rare and Dispersed Elements)

SUBMITTED: February 11, 1961

Fig. 6: A column for refining tungsten and molybdenum chlorides

Legend: 1 - evaporator; 2 - salt column; 3 - electric furnace; 4 - condenser; 5 - for neutralization; 6 - dry chlorine.



Card 2/2

S/149/62/000/001/007/009
A006/A101

AUTHORS: Shevtsova, Z. N., Kottser, L. A., Korshunov, B. G.

TITLE: On the interaction of neodymium chloride with sodium and potassium chlorides in melts

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Tsvetnaya metallurgiya,
no. 1, 1962, 121 - 126

TEXT: The authors studied the interaction of neodymium, sodium and potassium chlorides during the joint crystallization of their melts. The interaction of components in a $\text{NdCl}_3\text{-NaCl-KCl}$ system was investigated by the fusibility method. Cooling curves were recorded with the Kurnakov pyrometer. Six internal sections of the system were studied. Their orientation was determined mainly by the location of non-variable equilibrium points on lateral double diagrams. Section ($\text{K}_3\text{NdCl}_6\text{-NaCl}$) is stable and divides the diagram into two partial diagrams corresponding to systems $\text{NdCl}_3\text{-NaCl-K}_3\text{NdCl}_6$ and $\text{K}_3\text{NdCl}_6\text{-NaCl-KCl}$. The eutectic point of the section (Figure 7) (Van Rheyne point) corresponds to the following composition in mol. %: 17.6 NdCl_3 , 29.6 NaCl , 52.8 KCl and $538 \pm 2^\circ\text{C}$ melting temperature. The horizontal, marked on the diagram, corresponds at 420°C to the

Card 1/8 2

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On the interaction of...

polymorphous transformation of the chemical compound K_3NdCl_6 . On the basis of data obtained, a fusibility diagram of the ternary system was plotted. The liq-uidus-surface of the system consists of five fields of initial crystallization corresponding to the separation of $NdCl_3$, $NaCl$, KCl , K_2NdCl_5 , and K_3NdCl_6 from the melt. There are 7 figures, 1 table and 16 references, 9 Soviet-bloc and 7 non-Soviet-bloc.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii (Moscow Institute of Fine Chemical Technology) Kafedra tekhnologii redkikh i rasse-yannykh elementov (Department of the Technology of Rare and Dispersed Elements)

SUBMITTED: March 27, 1961

Card 2/8 2

APPROVED FOR RELEASE: 06/14/2000

KURSHUNOV, B.G.; GOL'DIN, V.I.; AVERKINA, L.I. CIA-RDP86-00513R000824930012

Purification of tungsten hexachloride and molybdenum pentachloride from admixtures of iron and aluminum chlorides. Izv.vys.ucheb. zav.; tsvet.met. 5 no.1:101-106 '62. (MIRA 15:2)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii, kafedra tekhnologii redkikh i rasseyannykh elementov.
(Tungsten--Metallurgy) (Molybdenum--Metallurgy)
(Chlorides)

SHEVTSOVA, Z.N.; KOTTSEK, L.A.; KORSHUNOV, B.G.

Interaction of neodymium chloride with molten sodium and
potassium chlorides. Izv.vys.ucheb.zav.; tsvet.met. 5 no.1:121-126
'62. (MIRA 15:2)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii, kafedra
tekhnologii redkikh i rasseyannykh elementov.
(Neodymium chloride) (Sodium chloride) (Potassium chloride)

37173

S/078/62/007/005/013/014
B101/B110

10.9200

AUTHORS: Korshunov, B. G., Raskin, B. Ya.

TITLE: Study of the interaction of chromium (III) chloride with sodium, potassium, and magnesium chlorides

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 5, 1962, 1137-1140

TEXT: The binary systems $\text{CrCl}_3 - \text{NaCl}$, $\text{CrCl}_3 - \text{KCl}$, and $\text{CrCl}_3 - \text{MgCl}_2$, as well as the ternary system $\text{CrCl}_3 - \text{NaCl} - \text{KCl}$, were investigated to find the optimum conditions for the electrolytic deposition of chromium. Results: (1) The congruently melting compound Na_3CrCl_6 , m.p. 603°C , is formed in the system $\text{CrCl}_3 - \text{NaCl}$. This pink-colored compound is polymorphous: the α -modification is stable below 440°C , the β -modification above this temperature. A eutectic is formed at 593°C from $\text{Na}_3\text{CrCl}_6 + \text{NaCl}$ with 21.2 mole% CrCl_3 , and at 570°C a eutectic from $\text{Na}_3\text{CrCl}_6 + \text{CrCl}_3$ with 31.4 mole% CrCl_3 . Mixtures with compositions similar to that of Na_3CrCl_6

Card 1/4

APPROVED FOR RELEASE: 06/14/2000

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Study of the interaction of...

showed increased viscosity. (2) The pink-colored compound K_3CrCl_6 , m.p. 840°C , is formed in the system $\text{CrCl}_3 - \text{KCl}$. The eutectic $\text{K}_3\text{CrCl}_6 + \text{KCl}$, m.p. 700°C , contains 10.7 mole% CrCl_3 , the eutectic $\text{K}_3\text{CrCl}_6 + \text{CrCl}_3$, m.p. 795°C , contains 46.4 mole% CrCl_3 . (3) The phase diagram $\text{CrCl}_3 - \text{MgCl}_2$ belongs to the eutectic type. The mutual solubility of the components is insignificant (about 2 mole% CrCl_3 in MgCl_2). The data for the eutectic agree with those for MgCl_2 . (4) Nine cross sections were investigated in the system $\text{CrCl}_3 - \text{NaCl} - \text{KCl}$, and the phase diagram was plotted (Fig. 6). The following was found for the points of phase equilibrium:

Card 2/4

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Study of the interaction of...

Point of quaternary phase equilibrium	Phases	°C	Composition, mole%		
			CrCl ₃	NaCl	KCl
E ₁	liquid = NaCl + KCl + K ₃ CrCl ₆	604	6.6	45.6	47.8
E ₂	liquid = NaCl + K ₃ CrCl ₆ + Na ₃ CrCl ₆	570	23.0	72.0	5.0
E ₃	liquid = Na ₃ CrCl ₆ + K ₃ CrCl ₆ + CrCl ₃	548	33.6	61.4	5.0

There are 6 figures and 1 table.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii im.
M. V. Lomonosova (Moscow Institute of Fine Chemical
Technology imeni M. V. Lomonosov)

SUBMITTED: May 15, 1961

Card 3/4

APPROVED FOR RELEASE: 06/14/2000

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B101/B110

Study of the interaction of...

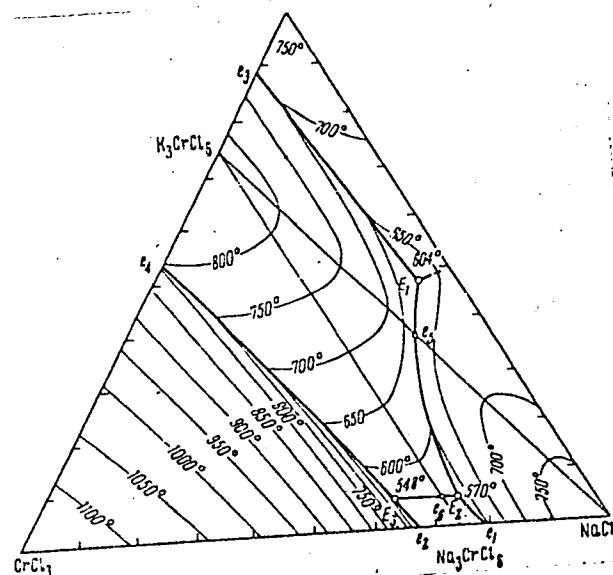


Fig. 6. Melting diagram
of the system
CrCl₃ - NaCl - KCl.

Card 4/4

S/078/62/007/008/006/008
B101/B138

AUTHORS: Korshunov, B. G., Safonov, V. V.

TITLE: Thermal analysis of NbCl_4 - NaCl - KCl melts

PERIODICAL: Zhurnal'neorganicheskoy khimii, v. 7, no. 8, 1962, 1974-1978

TEXT: In view of the increasing technical importance of Nb and lack of data on the physical properties of low niobium chlorides the fusibility diagram of the NbCl_4 - NaCl - KCl system was plotted (Fig. 7). The easiest method of producing ternary mixtures was found to be by the reduction of NbCl_5 to NbCl_4 by metallic Nb in the presence of NaCl and KCl in vacuo at $210^\circ - 230^\circ\text{C}$. The formation of Na_2NbCl_6 and K_2NbCl_6 accelerates the reduction of NbCl_5 and prevents the disproportionation of NbCl_4 . Mixtures containing more than 33.3 mole% NbCl_4 were not completely fusible as NbCl_4 decomposes to form NbCl_5 . The resulting data can be used suitable to determine the optimum conditions for the electrolytic refining of Nb.

Card 1/3

Thermal analysis of NbCl_4 - NaCl - KCl ... S/078/62/007/008/006/008
B101/B138

There are 7 figures.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii im.
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SUBMITTED: September 11, 1961

Fig. 7: Fusibility diagram of the NbCl_4 - NaCl - KCl system.

Card 2/3

Thermal analysis of NbCl_5 - NaCl - KCl ... 3/078/62/007/008/006/008
B101/B135

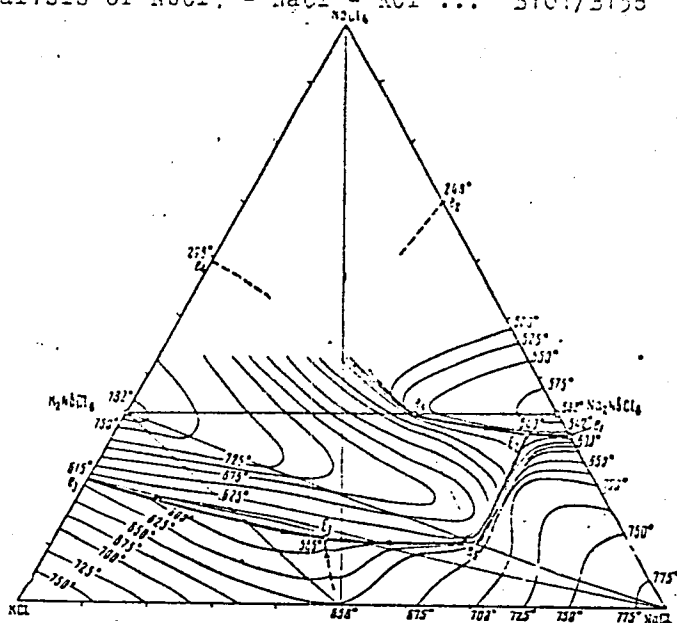


Fig. 7

Card 3/3

S/078/62/007/008/007/008
B101/B138

AUTHORS: Safonov, V. V., Korshunov, B. G., Shevtsova, Z. N.

TITLE: Investigation of the interaction of niobium (IV) chloride with rubidium and cesium chlorides in melts

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 8, 1962, 1979-1982

TEXT: The fusibility diagrams of the NbCl_4 - RbCl and NbCl_4 - CsCl systems were constructed to determine the optimum conditions for electrochemical deposition of niobium from melts, for the purpose of refining crude niobium etc. Mixtures containing more than 50 - 55 mole% NbCl_4 could not be studied owing to NbCl_4 disproportionation. Results: (1) The congruent-melting compound Rb_2NbCl_6 forms in the system NbCl_4 - RbCl at 802°C . The eutectic of this compound and RbCl melts at 630°C and contains 83 mole% RbCl . (2) The congruent-melting compound Cs_2NbCl_6 forms in the system NbCl_4 - CsCl at 822°C . The eutectic of this compound and CsCl melts at

Card 1/2

Investigation of the interaction of ...

S/078/62/007/008/007/008
B101/B138

595°C and contains 90 mole% CsCl. The eutectic of Cs_2NbCl_6 and NbCl_4 melts at 282°C and contains 43 mole% CsCl. (3) A study of Cs_2NbCl_6 and Rb_2NbCl_6 in polarized light showed these compounds to be optically isotropic. (4) The calculation of crystallization curves on the basis of the Shreder equation suggests that melts of the NbCl_4 - RbCl system contain niobium as $[\text{NbCl}_6]^{2-}$, whereas the NbCl_4 - CsCl system may contain $[\text{NbCl}_5]^-$ as well as $[\text{NbCl}_6]^{2-}$. There are 4 figures. ✓

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii im.
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SUBMITTED: October 2, 1961

Card 2/2

SHEVTSOVA, Z.N.; KORZINA, Ye.N.; ~~KORSHUNOV~~, B.G.

Interaction of praseodymium chloride with sodium and
potassium chlorides in melts. Zhur.neorg.khim. ?
no.11:2596-2599 N '62. (MIRA 15:12)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii
imeni Lomonosova.
(Praseodymium chloride) (Alkali metal chlorides)
(Fused salts)

PASHINKIN, A.S.; DROBOT, D.V.; SHEVTSOVA, Z.N.; KORSHUNOV, B.G.

Determination of vapor pressure of anhydrous solid chlorides
of yttrium and samarium. Zhur.neorg.khim. 7 no.12:2811-2813
D '62. (MIRA 16:2)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni
Lomonosova i Moskovskiy gosudarstvennyy universitet imeni
Lomonosova.
(Yttrium chloride) (Samarium chloride) (Vapor pressure)

BREUSOV, O.N.; PETROV, L.M.; LYANDUSOV, B.G.; KORSHUNOV, B.G.; DERBIN, M.M.

Apparatus with continuous action for the chlorination of high-melting metals. Prom.khim.reak. i osobo chist.veshch. no.2:46-48 '63.

(MIRA 17:2)

L 10642-63

EWI(q)/EWT(m)/BDS--AFFTC/ASD--JD/JXT(IJF,DE)

ACCESSION NR: AP3001227

S/0078/63/008/006/1531/1532

AUTHOR: Korshunov, B. G.; Lidina, Ye. D.; Shevtsova, Z. N. 61

TITLE: Melt diagram for the system ^MMoCl sub 5 - ^MAlCl sub 3 - ^MFeCl sub 3

SOURCE: Zhurnal neorganicheskoy khimii, v. 8, no. 6, 1963, 1531-1532

TOPIC TAGS: melt diagram, MoCl sub 5-AlCl sub 3-FeCl sub 3, eutectics,

ABSTRACT: The melt diagram for the MoCl sub 5 - AlCl sub 3 - FeCl sub 3 system is given. Eutectics for MoCl sub 5 - AlCl sub 3 = 121 degrees; for MoCl sub 5 - FeCl sub 3 = 88 degrees; surface of the liquidus corresponds to the separation of MoCl sub 5 from solution and to the solid solution of Al and Fe chlorides.

"Indices of refraction of crystals of the compounds were determined by L. V. Milyutina, for which the authors express their deep appreciation." Orig. art. has: 1 figure.

ASSOCIATION: Moskovskiy institut tonkoy khimicheskoy tekhnologii im. M. V. Lomonosova (Moscow Institute of Fine Chemical Technology)

SUBMITTED: 12Nov62

DATE ACQD: 01Jul63

ENCL: 00

Card 1/2

KORSHUNOV, B.G.; LAPKINA, Ye.D.

The system $\text{MoCl}_5 - \text{AlCl}_3 - \text{NaCl}$. Zhur. neorg. khim. 8
no.11:2585-2588 N '63. (MIRA 17:1)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii
imeni Lomonosova.

SAFONOV, V.V.; KORSHUNOV, B.G.; SHEVTSOVA, Z.N.; SHADROVA, L.G.

Interaction of tantalum tetrachloride with rubidium and
cesium chlorides. Zhur. neorg. khim. 9 no.6:1406-1410 Je '63
(MIRA 17:8)

1. Moskovskiy institut toikoy khimicheskoy tekhnologii imeni
Lomonosova.

REEL # 249

Koros, E.

To

Korshunov, B.G.

